UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF TENNESSEE

ROCKY WATERS MOUNTAIN INN, LLC,
Plaintiff,
v. Docket No. 3:19-CV-6
THE TRAVELERS INDEMNITY COMPANY OF AMERICA,
Defendant.

VIDEOTAPE DEPOSITION
OF
NEIL G. CARLSON

Taken February 28, 2020 By Christine M. Clark, RPR

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ALSO PRESENT:
Stephen Smith, Legal Videographer

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INDEX OF EXHIBITS

(Exhibits marked prior to deposition.)

THE VIDEOTAPE DEPOSITION of NEIL G. CARLSON is taken on this 28th day of February 2020, at Benchmark Reporting Agency, 450 South Ninth Street, Suite 450, Minneapolis, Minnesota, commencing at 12:55 p.m.

THE VIDEOGRAPHER: Good afternoon. We are on the record, and the time is 12:55 p.m. This is the videotaped deposition of Neil Carlson, in the matter of Rocky Waters Motor Inn v. The Travelers Indemnity Company of America, Case Number 3:19-CV-6, filed in the United States District Court, Eastern District of Tennessee.

The court reporter's name is Christine Clark. My name is Stephen Smith, the legal videographer. We are with Benchmark Reporting Agency.

Would the attorneys present please introduce themselves?

MR. DEVILLING: Brian Devilling, for Travelers.

MR. SCOTT: Clint Scott, for the plaintiff.

THE VIDEOGRAPHER: Thank you very much. The court reporter will now swear in the witness and then we can proceed.

NEIL G. CARLSON,
a witness in the above-entitled action,
after having been first duly sworn,

deposes and testifies as follows:

EXAMINATION

BY MR. DEVILLING:

Q. Hello, Mr. Carlson. My name is Brian Devilling. I represent Travelers in the Rocky Waters Motor Inn versus Travelers Indemnity case.

Have you given a deposition before?

A. Yes, I have, sir.

Q. All right. How many times?

A. Between less than 20, but more -- probably more than 10.

Q. Okay. Standard ground rules apply. If you could wait -- wait to give your answer until I'm done asking my question. Okay?

A. Yes, sir.

Q. And if you need a break at any time, let me know. Okay?

A. I will, sir.

Q. And if you can answer yes or no as opposed to uh-huh or uh-uh, it makes it easier for the court reporter to transcribe.

A. Yes, sir.

Q. And if you don't understand a question that I ask, just let me know and I'll rephrase it.

A. Thank you, sir.

Q. What is your current employment position?

A. I am currently employed at the University of Minnesota

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Department of Environmental Health and Safety, as an industrial hygienist and as a public health specialist, and I also do consulting work as President of N.G. Carlson Analytical. And I'm representing N.G. Carlson Analytical and not any way affiliated with the University of Minnesota with respect to this case.

Q. Okay. All the work you did in this case is through N.G. Analytical, correct?

A. That is correct, sir. Yes.

Q. I'm sorry. N.G. Carlson Analytical.

A. That's correct. N.G. And I think, for legal purposes, I think it's N.G. Carlson Analytical, Inc., but...

Q. Okay. In your position with the University of Minnesota, do you do any teaching?

A. I do adjunct faculty teaching, yes, sir.

Q. And what courses do you teach?

A. I assist with teaching a course in laboratory analysis for industrial hygiene students. I teach a course on indoor air with respect to housing and housing inspection for a group on the St. Paul campus. I also teach an architecture class on indoor air quality, and these are typically one to two session pieces. I'm -- I'm assisting the -- the faculty member. I also teach a course with the Midwest Center on fungal remediation, and we do that as needed.

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Q. Have you taught any courses on -- or portions of any courses on any topics related to wildfire analysis?

A. No courses on wildfire analysis, sir.

Q. Okay. I'll show you what we've marked as Exhibit 1. I believe this is a copy of your CV, correct?

A. Yes, sir. That is.

Q. All right. And can you just look through it and let me know if it's current?

A. It's the most current one that I put together, yes.

Q. Any additional seminars, publications, licenses, degrees that need to be added to this to make it complete?

A. Well, let me look. Let me see if they have the one. I think the one that might be relevant to this case is that I reviewed a webinar, although I did not attend it. It was on smoke and soot analysis, from EMLab P&K. So I don't know if that one's listed here, but I think that would be the relevant one.

Q. Okay.

A. There are probably other ones, but I don't think they'd be relevant to this case.

Q. Can you point me to aspects of your CV that are -- that you consider relevant to wildfire analysis?

A. I don't think I'd have any specific ones with respect to wildfire analysis.

Q. Okay. How about same -- same question, just slightly

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different. How about with respect to analyzing debris from a wildfire?

A. Nothing specific to analyzing debris from a wildfire.

Q. Okay. Let's see. You're -- what was your undergraduate degree?

A. Biology, with a minor in chemistry.

Q. Okay. That's from the University of Minnesota, Morris, correct?

A. That is correct, yes.

Q. And then you got an MS in General Environmental Health, correct?

A. Yes. From the University of Minnesota.

Q. Was any of your training for your Master's in General Environmental Health specifically pertinent to wildfire debris or wildfire analysis?

A. Not specific to wildfire analysis.

Q. Okay. Excuse me. At this point in your career, have you -- I assume that you've analyzed debris under a microscope on multiple occasions for the purpose of determining whether it was a -- contains wildfire residue?

A. Let's see. Yes. And it wouldn't be specific to wildfire residue, if I may add. It would be soot or char, irrespective of what the source was.

Q. Okay.

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A. Does that clarify?

Q. Yes.

A. Okay.

Q. Yes, it does. Do you know how many -- how many cases you've been involved in or analyzed involving claims that wildfire debris has caused damage to property?

A. I wouldn't know the exact one because when I get the reports it doesn't specify whether it was a building fire. So an internal source or an external source wildfire. So I couldn't give you a precise number on that. I can give you a range, if that would be helpful.

Q. Sure.

A. I would say more than probably 20 and definitely less than 100.

Q. Okay. How many times have you analyzed debris for the purpose of determining the level of soot or char in the debris?

A. That would be more then 100, less than 200.

Q. Okay. Are you the sole owner of N.G. Carlson Analytical, Inc.?

A. Yes, sir.

Q. Okay. And how long has that company been in existence?

A. That company has been in existence -- and if you wouldn't mind, sir, I will refer to here.

Q. Certainly.

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A. So I will make sure I get an accurate -- accurate date on that. Let's see here.
Q. And just, for the record, what are you looking at?
A. I'm looking at -- sorry. Thank you, sir. I am looking at my CV.
Q. Oh, okay.
A. Thank you for asking that. If you don't mind, sir, I have taken a photo of that particular piece of information on my cell phone, and I can refer to that to give you a correct date. Would that be acceptable to you?
Q. Well, has the company been around for more than 10 years?
A. Yes. It was approximately -- and the date is approximately '96.
Q. Okay. And what does N.G. Carlson Analytical do?
A. N.G. Carlson Analytical does fungal -- fungal spore analysis. I've also done ergonomic analysis, although that's not my primary work. Indoor air quality assessments. I'll do home assessments for indoor air quality, both viable, nonviable fungal spore analysis. And then I'll do particulate analysis with respect to soot, char analysis, and that started September of 2 -- 2011 is when we started doing that.
Q. Okay. About what percentage of your work in the last

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year has involved analysis of fire debris as opposed to analysis for fungal spores?
A. I'm going to give you a rough estimate in a range. I would say probably -- because some of it is actually mixed. So it's going to be a little difficult, and I actually do both on a dataset, but, if you count both, I would say between probably 50 and 75 percent.
Q. Okay. Can you give me examples of the types of people or entities that hire N.G. Carlson Analytical?
A. Sure. There's been primarily two companies that hire it. And I'm assuming -- are you -- point of clarification, sir. Are you looking at primarily just the soot and char, or are you looking at fungal, soot and char?
Q. Everything.
A. Everything. Okay. The first one would be personal homeowners that -- and there would be a wide variety of them that would call and just say I've got a mold problem and I need somebody to take a look at it about. The second one would be FBS, and then there's also a company, PCG, I believe, that has also had me do work. There are a couple other companies. Their names escape me, but they're similar, similar structure to what PCG and FBS would be with respect to sending me samples and then asking me to do analysis.

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Q. Okay.
A. Is that helpful?
Q. Yeah. So with respect to all of your work --
A. Mm-hmm.
Q. -- whether it's related to mold spores or related to soot and char analysis, can you tell me what percentage of your work comes from personal homeowners who ask you directly to analyze some sort of --
A. Yeah.
Q. -- substance?
A. I would say homeowners are -- represent -- it varies annually, but definitely represent less than 25 percent.
Q. Okay. And then how about FBS?
A. It varies each year. I would say probably around roughly 40 percent. It varies. Forty, 40 to 50 percent.
Q. And when you say FBS, you're talking about Forensic Building Sciences, correct?
A. Yes, sir. Forensic Building Sciences.
Q. That's Tom Irmiter's company?
A. That's correct. Yes, sir.
Q. Then what does PCG stand for?
A. I would have to look that up. I'm not sure. I've just seen PCG, and it's a -- I believe it's a -- it looks like a law firm or something like that, and they have --

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they do primarily work with fire cases, and they also do some work that apparently runs into some mold issues.
Q. Okay. Do personal homeowners, have they ever contacted you directly to analyze fire debris, or is that more the mold issues?
A. I'm trying to think if anyone's ever done that. I think primarily the personal homeowners are -- are fungal.
Q. Okay. And how about in terms of the work that you said that 40 percent of your overall work comes from Forensic Building Sciences? Is that a mix of fire debris and mold analysis?
A. Yes. Lately -- and that shifted. When I first started out, it was -- prior to 2000, it was all mold analysis. And then the percentage has shifted over to higher soot and char analysis as we've progressed.
Q. Have you ever done a soot and char analysis for anyone other than FBS?
A. Yes. The PCG would be one, and then there's a -- there was another company who just sent me one -- I can't recall their name -- just recently. And I -- there's a couple other companies, and I don't remember. I've only done, I would say less than 10 percent business, but I can't recall their names.
Q. Are the other companies also law firms?
A. I do not know.

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Q. Okay.
A. Or I do not know, or I do not recall.
Q. About how many times have you analyzed debris for Forensic Building Sciences, whether it be for mold or for soot and char?
A. That's a -- I -- I don't recall for sure. I can give you a range that it's -- let's see. It would be more than -- definitely more than 200, probably less than 600.
Q. Okay.
A. Just to make sure I'm accurate.
Q. Somewhere in there?
A. Somewhere in that range --
Q. All right.
A. -- sounds good.
Q. Do you know how many times you've analyzed soot and char for FBS?
A. It would be -- I'm going to guess it's -- well, I don't want to say guess because I was attempting to determine that before, looking through, and my emails didn't go back to when I started as far as doing a count. So it is more than 50 but less than probably 150, at my best estimate.
Q. Okay. When you get a -- well, when FBS sends you a sample they want analyzed, how does that communication

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happen? Is it by email or phone or what?
A. It can come several different ways. Primarily, sometimes I will just get a package without any email communication, and then I will do the analysis. Sometimes I will get a -- a phone call just saying are you available, we have samples coming. Not often that I'll get an email notification of the way -- maybe sometimes I will. In this case, as far as when I look through the email chains, I didn't see an email coming beforehand.
Q. Okay. Can you describe -- just if I -- well, first of all, where is your lab located?
A. I do my analysis at two locations. One is I have a microscope set up in my home, in my residence. Do you need the address of that?
Q. No, I don't need the address.
A. Okay. All right. So I have a lab set up in my home. And then I also use a microscope that I have available at the lab at the University of Minnesota.
Q. All right.
A. But primarily most of the work is done at home.
Q. What kind of microscope?
A. It is -- the one at the lab is a -- it's a light microscope. It is an Olympus. I don't know the exact name of it. It's got 4X, 10X, 40X and 60X are the ones

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that I use on that one, and the -- and the name of the scope that I have is escaping me. It's essentially a light microscope. I don't recall the brand for the one at home. And then I have 4X, 10X, 20X, 40X and 60X that I use for analysis, and it's a light, both are light microscopy.
Q. Okay. Do you have any equipment that can go beyond 60x?
A. I can, but I don't use that typically. There's an oil immersion setting, and I typically don't go -- don't go to that.
Q. Okay. So do you have any other equipment that you consider part of the laboratory?
MR. SCOTT: Object to the form.
A. I -- I don't understand --
Q. (MR. DEVELLING) Sure.
A. -- exactly what you're -- you're talking about.
Q. Sure. Do you have any other equipment that you use to analyze debris samples, other than those two microscopes?
A. Well, let's just say I'll -- to maybe help clarify, I use microscope slides. I use mounting fluids. I use coverslips. I use a 3M red tartan Scotch tape. Let's see if there's anything else. I may use something to break a sample up a little bit if it's too compact, some mechanical piece. Tweezers. That -- I think that would

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approximately be it.
Q. Okay. Do you have any equipment that's capable of doing an elemental analysis of any debris?
A. I don't -- as you asked it, I'm not doing anything other than visual light microscopy analysis. I'm not doing a chemical analysis. Was that what you were asking?
Q. Yes.
A. Okay.
Q. Well, actually, what I want to know, if you have any equipment capable of doing a chemical analysis.
A. No, I do not.
Q. Okay. Would you know how to run a test to determine the elemental composition of any particulate material?
A. No. That's not the type of analysis that I'm doing.
Q. Okay. And are you trained to do that analysis?
A. To do the chemical analysis, no.
Q. All right. I've heard the certain laboratories described as Level 1 laboratories and also Level 4 laboratories. Are you familiar with that distinction?
A. Yes, I am, sir.
Q. What's the difference between a Level 1 and a Level 4 laboratory?
A. Well, Level 1 laboratory will be doing light microscopy to do a visual analysis through magnification of the particles that are either on an Air-O-Cell sample or a

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tease tape sample or bulk sample and look at it under the microscope, but there is no chemical analysis done on a Level 1 as to chemical composition of it. There isn't enhanced magnification through let's say electron microscopy. There isn't any other specific chemical analysis of -- of the different types of particles in there. So I did -- I did not do any of that.

Q. Okay. Do you charge a flat fee for doing your Level 1 microscopy analysis?

A. Yes. I have two separate flat fees. One is $35 for both fungal and soot and char analysis, and another one, if they need to have a rush sample, it's $50 a sample.

Q. Oh, for rush?

A. Yeah, for rush.

Q. Okay.

A. Yeah.

Q. Do you charge anything additional for drafting a report of what you saw?

A. No. The only additional charge I would is if -- if I have to -- if they would like photographs included with the report, I charge $5 for photographs because it takes some time to put the photos in the report, but I don't charge for putting together a report for that analysis. Now, if I am asked to comment on or give interpretation on the report, then I charge $150 an hour to prepare

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that for just a straight one, nonlegal, but just a straight one.

Q. Okay. In this case, did you do any interpretation of the results, or did you just provide FBS with the -- with the results themselves?

A. I didn't do any extensive interpretation. About the only thing that would be construed as interpretation probably would be that I bolded some areas. Let me take a look at the re -- may I refer to the report, sir?

Q. Yeah. Why don't we do this.

A. Okay.

Q. I already marked color --

A. Okay.

Q. -- copies of both reports as Exhibits 2 and 3.

A. Sure.

Q. This would probably be a good time for me to hand these over to you.

A. Okay.

Q. First of all, is Exhibit 2 a true and correct copy of your report with respect to samples from the Days Inn on Hemlock Street?

A. I'll just -- if you don't mind, I'll just compare to what I've got --

Q. Sure.

A. -- to make sure that it's accurate.

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Q. Yeah, by all means.

A. Let's see where -- there's the Days Inn. Yes, sir.

Q. All right. So Exhibit 2 is a complete copy of your report with respect to the Days Inn, correct?

A. Yes, sir.

Q. And if you could look at Exhibit 3 and let me know if that's a true and correct copy of your report with respect to the Rocky Waters Motor Inn.

A. Yes, sir.

Q. All right. Now I forget the original question that caused us to get those out.

A. Oh, we were -- I think, sir, we were trying to determine if I gave any more interpretation of the analysis.

Q. Correct.

A. Is that correct, sir?

Q. Yeah. Could you let me know if you did provide any additional interpretation beyond just the, you know, characterizing the results themselves?

A. I think the only other interpretation would be in the discussion session, and it would just give the range of -- of the relative concentration of the char-like and soot-like particles in both -- in both of those. I also stated that they didn't do any chemical identification. So essentially stating that I'm not doing a Level 4 analysis.

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Q. Okay.

A. I'm doing a Level 1.

Q. Are there organizations that provide accreditation to laboratories?

A. There are. I think the -- I participate in the ones that deal with fungal identification. I'm not -- I'm not cognizant of the specific one associated with the Level 1 analysis.

Q. All right. Is your laboratory accredited by anyone?

A. For -- for -- no, it is not.

Q. Okay. And is there any specific accreditation for laboratories analyzing fire residue?

A. I -- there may be. I'm -- I don't know.

Q. Is there any specific accreditation, to your knowledge, for laboratories analyzing fungal spores?

A. Yes, there is. The fungal spore accreditation is handled with the American Industrial Hygiene Association. They have a couple different levels of accreditation. They have one process that they do through EMPAT that has for culturable fungi. There's also one that they do for nonviable fungal organisms. I do participate in the -- in both of those through the University of Minnesota. Our specific lab though is not accredited with the -- with that organization.

Q. All right. And does that include the -- that would

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include your lab that you have at home and what you use at Minnesota?

A. I'm not exactly sure we're -- are you saying being not accredited, or what are you saying?

Q. Yeah. If I understood your testimony earlier, you said you sometimes use a microscope at the University of Minnesota, and you sometimes use one that's at your home laboratory, correct?

A. Yes. Yes.

Q. Do you know where you performed the analysis in this case?

A. I -- I do not recall. It would have been in one or the other. I would say, given what I'm looking at here, let me look at the --

Q. Sure.

A. May I look at the photos? And that would tell me. The photos are taken with my microscope at home. If I took the photos with the microscope at the university, there would be a grid marking.

Q. Okay. Your home lab is not accredited by -- or accredited by any organization, correct?

A. That is correct. Yes, sir.

Q. Do you have any background in the field of construction or engineering?

A. Modest background. Not in -- not with respect to

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construction, but with respect to investigating buildings that have had water damage and that type of stuff, and some experience with plan review for building construction, and then in certification of buildings post construction.

Q. And what is your role in -- in those instances?

A. In those instances -- and those are primarily done through the University of Minnesota. I will get a plan review and then determine if the ventilation system is set up appropriately for the type of occupancy in the building, and then will do some review about proper drainage systems on the -- on the building. Not -- and then, when they're doing remodeling for a roofing project, will take a look at the location of the -- of the asphalt device and with respect to air intakes.

For the consulting, I have done some inspections, and more recently, and that would be after these reports were done, but in a building where there's been significant fire damage. And they ask me to come in and assist with developing a sampling protocol and then analyzing the -- the samples.

Q. Do you have any medical training?

A. I received training as a certified nursing assistant and I've taken other courses, but I don't have any degree in that.

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Q. Okay. You've never been licensed in the medical field?

A. No, I have not been licensed.

Q. Do you have any training in toxicology?

A. Yes. I've had training in toxicology through the University of Minnesota with respect to the master's program I had. I took a course in toxicology. I also took some courses in -- there was a seminar that was in New York on microtoxins. So I've done some work on that. And there -- through the continuation education that I received here, there's probably been many other courses on it, but I don't recall all of them.

Q. Okay. You're not a toxicologist though?

A. That is correct.

Q. Okay.

A. I am not a toxicologist.

Q. Are your opinions in this case, are they fully expressed here in what you see as Exhibits 2 and 3?

A. As far as I know, unless you ask me a question that might trigger something else.

Q. Sure.

A. But as far as I know, yes.

Q. Okay. Let's talk about, first of all, your report for the Days Inn.

A. Okay.

Q. I believe we marked that as Exhibit 2, right?

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A. That is correct. Yes, sir.

Q. Actually before we get into that, you -- so when you're retained by FBS, they send you -- well, how do they send you samples to analyze?

A. There's a couple different ways that they send. Sometimes they will personally drop it off at my -- at the university location and hand it to me. In other ways, they will ship it by mail to my residence. They may also have it sent by UPS or FedEx and have it placed in a box by my door.

Q. Do you know how the samples in this case were delivered to you?

A. I don't recall, sir.

Q. Okay. Suffice to say though, at some point you received some samples from FBS with respect to the Days Inn and the Rocky Waters Motor Inn, correct?

A. Yes. That's correct, yeah.

Q. And I assume you're -- the only basis you had for knowing that they came from Days Inn and Rocky Waters Motor Inn was information you got from FBS, correct?

A. That is correct, sir, yes.

Q. Have you -- have you ever been to either of those properties?

A. I have not been to those properties, sir.

Q. Okay. And by the way, in this case, have you -- have

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you reviewed any -- any estimates related to the insurance claim?

A. I want to think for a second to make sure. I don't recall seeing any estimates on this one, and, if something comes to light later, that would be just because of faulty memory, but I don't recall.

Q. Have you reviewed any other expert reports in this case?

A. I did review one, two sets of other expert reports with respect to both the Rocky Waters Motor Inn and the Days Inn.

Q. And what reports were those?

A. That was a Level 4 analysis, and I don't recall the name of the company. That was done on both properties.

Q. Okay. Was it Enrique Medina Alliance Consulting?

A. I -- I -- I think that's probably it. I don't recall the name, but I think so.

Q. Okay.

A. Is it a company based out of California?

Q. Yes, sir.

A. Okay. Then I believe that would be it.

Q. Okay. Beyond -- beyond the fact that they did a Level 4 analysis, as you sit here today, do you have any specific recollection of Mr. Medina's or Alliance Consulting's findings?

A. Other than the fact that it was a Level 4 and that they found, or they found -- at least reading through it, based on their report, they found char and soot particles and that there was a suggestion about using that analysis to determine possible origin of the fire.

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Q. Okay. Beyond that, do you have any recollection or opinions about the report?

A. Not that I can recall right now. But if there's another question that comes up that triggers it, I will respond.

Q. Certainly. Okay. All right. So, once you receive a sample from FBS, what do you do with it?

A. Well, the first thing I do is take it into my lab area, and then I will sign off on the -- the chain of custody. So I'll -- I think I probably got a copy of it for each one. But I'll sign and date when I receive the sample, and then -- then I'll sign and then I will date it when I did the analysis.

Q. Where -- where is your lab located in your home?

A. It is in -- I got to get the directions right. It is in the southwest corner of my house.

Q. First floor or basement?

A. It's -- it's a split level. So it would be first floor.

Q. Okay. Is it an isolated room?

A. It's an isolated room. I have a microscope set up with my Sharps boxes on one side and then tease tape, mounting fluid equipment on the other side. And then I have a location where I can do my write-up on the report, and then a disposal spot for the materials when I'm finished.

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Q. Okay. I asked a little bit earlier about accreditation for laboratories.

A. Yes.

Q. Is there any licensing or accreditation that is given out to individuals like yourself?

A. I am not aware of that. Or I'm -- now let's clarify your question. Is that with respect to analysis of char and soot? Is that what you're asking, or...

Q. Well, let's start there. With respect to analysis of char and soot, is there any accreditation that's given out to individuals?

A. I do not know if there is. If there is, I'm not aware of it.

Q. How about with respect to analysis of fungal samples?

A. Well, the accreditation that I talked to, referred to previously with respect to the American Industrial Hygiene Association, and EMPAT does have accreditation.

Q. Okay. And earlier I asked if your laboratory was accredited. Let me ask the same question. Are you personally accredited by any organizations or licensed by any organizations?

A. I'm not accredited for any specific analysis. I do have a certified industrial hygienist, but that's not an accreditation. Is that clear --

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Q. Yeah.

A. -- for you?

Q. That's clear. Okay. So once you -- explain to me the process of getting the samples out of their container and onto a -- onto a slide, a microscope.

A. Sure. The samples would typically be in a -- in a box or a plastic Ziploc bag. I don't recall specifically with respect to these samples. I'd take the sample out, and it depends on -- if it's okay, I'm going to look and see if, you know --

Q. Sure.

A. -- what type we've got. So these, in the -- right now we're referring to Days Inn, correct?

Q. Well, my question is more general.

A. Okay. So for an Air-O-Cell cassette, I would write down the information that's presented on the Air-O-Cell cassette and place it on a lab report form. And, for instance, sample 1, and then all the information I can. Do a line below that and then take the -- there's an inside -- open up the Air-O-Cell cassette, and inside there there is a -- let's say a slide with a gel that's on one side, and no gel on the other. I'll place that on top of a microscope cover, microscope slide, and then

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place mounting fluid on a clear coverslip, and then place that directly on top of the -- of that material, and then take that directly onto a microscope stage and then visually look through the field. And then for soot-like and char-like particles, then and also look for fungal particles. And in some case, with respect to the Air-O-Cell cassette, make some sort of determination with respect to the density of the trace and then mark that information down in the lab note here. Once I'm done with that, then I will dispose of that in a Sharps container.

Q. Okay. Where does your training or expertise in terms of how to visually differentiate between char and soot come from?

A. When we first began, Tom Irmiter approached me and he asked me if I could do this analysis. And I said I am not familiar with it, and so we talked about ways of getting me familiar with it. So he purchased a large collection of different styles of wood. And so I took the wood into the laboratory, and at this time it was a laboratory that was over at Boynton Health Service, and we moved positions. And then I burned each different kind of wood and then took an Air-O-Cell cassette analysis or Air-O-Cell cassette sample close to the piece of wood. And then I looked at the resulting char

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from the different styles of wood. So that gave me some comfort level with respect to the variety of char styles I may anticipate seeing. So, after seeing a large number of them, I was able to -- to be comfortable with that analysis. Then, with respect to soot analysis, I burned some other material, primarily material that produced a little bit better soot particle. The wood, with the high temperature of burner, primarily produced more char than soot. And then we also had some electrical fires on campus that produced a large amount of soot particles. And there's a YouTube video out there that shows me taking a sample of that. Then I looked at the soot particles generated by that. And then also did online references. And I don't have the specific ones for you, but looking at here's how soot particles present and how they compare to some other particles that are somewhat similar.

Q. Have you ever received any training from any third parties as to how to visually differentiate between soot and char particles?

A. Not the -- not -- no -- no in-person third-party training. No.

Q. Okay. How does the appearance of char and soot particles differ under a microscope?

A. The char particle will typically be larger. It will be

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very plainer. It will have defined edges. Sometimes the char particle will have open circles in several spots due to the type of burn it's had. They may be a black and opaque with sharp edges, or they may be sort of amber colored, but, in general, they're fairly -- they're kind of -- I would call it sheets or very thin sheets with much larger width and length than -- than depth. Very thin.

The soot particles are typically less than one micron in size. They'll be a spherical. They tend to agglomerate into what look like small grapelike clusters. The edges are irregular. They're -- they are less opaque or less dark than the char particles and they'll have uneven edges. And they'll -- it's very difficult with the light microscopy -- microscopy to pick out one, but it can be pick out clusters. So that's why it's more of a presumptive method of doing -- you need electron microscopy to pick up something because it's outside the optical limit of the light microscopy.

Q. Okay. And the light microscopy goes -- on yours, goes up to only 60 times, right?

A. That's as high as I choose to look at -- at the particular samples I look at, yes.

Q. Okay. In terms of your lab analysis, do you -- do you

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analyze the Air-O-Cell cassette samples any differently than tape samples?

A. With respect to counts, it's slightly different. So the Air-O-Cell cassette samples, typically there are -- at 400x, there's typically approximately 25 fields from one end of the trace to the other. So, with respect to the number that's listed after like char or soot, that is the average number of that type of particles in that field. So, for instance, if I'll go along in -- in this section, and it depends on how many that are there, if it's a small number, then I will actually count the whole number of that type of particles from one end to the other and divide that number by 25 to get -- to get the number that's associated with this.

So, in other words, if I find 25 particles of char all the way through that whole trace, then the answer would be one, because there's one particle per field. Let's see here.

Q. So just so I have that clear then, so like if we look at the report that's marked as Exhibit 2 as an example --

A. Right.

Q. -- we have sample number 9, Room 412, dividing CMU. Do you see that?

A. Yes.

Q. And it says, char 1 to 2. Do you see that?

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A. Yes.
Q. Does that mean that's 1 to 2 particles per field that you observed?
A. That's correct, yes.
Q. And what is the size of that field?
A. The size of the field is the size of the field circumscribed by the 400x. I can give you a rough estimate of the size. It's approximately -- well, I would have to -- I'd have to measure it out with a micrometer. It's approximately -- do my diameters right. I think it's -- I'm going to give you approximate range between 150 and 200 micrometers in diameter.
Q. Okay. And how about in terms -- my -- my math is not as good as yours. Can you express that in square millimeters?
A. Well, let's see. I'd have to take it times pi.
Q. Okay.
A. Let's say I can do the radius. Let's say the radius is roughly 100. It's not a very big one as far as millimeters. It's micrometers. So do you really need it? I mean we can...
Q. No, I don't need an exact answer.
A. Okay.
Q. And if you don't have a reasonable approximation,

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there's no need to stop and figure it out.
A. Yeah.
Q. But is it -- after you've looked -- strike that.
Excuse me. For the record, I just had to stop and take a drink of water.
When you're analyzing the tape samples or the Air-O-Cell samples, do you look at the entire field?
A. As much as I can. In some cases, for instance, if I may refer to this, I think there's one. For instance, there was a tease tape sample that had char of 50 plus. I would look probably at the field, kind of zoom in a couple spots, but, if it's essentially opaque, I'm not going to go into every one that looks like there's a lot of problems. If there's a really low count, then I'm going to have to go through the whole field to make sure I'm -- because I'm looking for a needle in a haystack essentially.
Q. Okay. So, in terms of the field size that this is, we use number 9 as an example, char 1 to 2 particles, correct?
A. Yeah.
Q. And that's expressed as 1 or 2 particles per field that you're viewing under the microscope, correct?
A. Yeah. Yeah.
Q. And I don't -- I don't need an exact figure. But is

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that more or less than 1 square millimeter field?
A. It would be less.
Q. Okay. Looking at Exhibit 2, my understanding is that the notation Asp/Pen heavy, that's a reference to mold spores, correct?
A. Yes. It's -- it's a reference to Asp/Pen mold spores. The reason why it's designated Asp/Pen is the spores are similar to those produced by an aspergillus or penicillium organism, but using this technique with the tape, it's unable to differentiate between the two. That's why it's referred to Asp/Pen.
Q. Unable to differentiate between the aspergillus and penicillium?
A. That is correct. Yes, sir.
Q. All right. So you've -- in Room 407, interior wall, the first sample that you analyze here on Exhibit 2, this is a Days Inn, you noted that Asp/Pen was heavy, correct?
A. Yes.
Q. Do you know how many particles per field there were?
A. That one I don't typically measure in particles per field. If I -- if I may refer to the interpretation on -- let's see if I've got one in this one. This one actually -- okay. I usually have a fungal interpretation. This one I don't. The typical fungal interpretation is if I see fungal growth, so actual

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growth of a -- of organisms or a large number of fungal spores. But in this particular case the primarily -- primary analysis is focused on the soot and char; not so much in that. If I'm doing a specific fungal analysis, then I'll give you actual spores per cubic meter, but I didn't do that in this case.
Q. Okay. As you sit here today, we have no idea what the spores per cubic millimeter of mold spores was, correct?
A. No, I don't have a specific one.
Q. Okay.
A. In that it's based on past experience, it looked like there was a significant number that -- and when I do that, it just -- when I make this notation, it's just suggesting that when the person is looking at the spot that there may be an internal source for that organism in that space. And typically they'll follow up and try to figure out where that is or what's -- what's the problem.
Q. Okay. So on the sample number 1, Room 407, interior wall, what was the proportion of mold spores that you observed to char and soot particles?
A. I won't give you a -- I can't give you an exact one, but I would say -- let's see. If I'm looking at maybe a 1,000 to 1 or something or more.
Q. So like 1,000 -- 1,000 units of the mold spores to 1

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unit of the char and soot?
A. Yeah. Since the char and soot are negligible there.
Q. Okay.
A. There's not very many. So it would be primarily those. And I'm ball-parking it with respect to 1,000.
Q. Sure. You've got Asp/Pen noted at moderate to light down here on sample 10. Can you tell me what range of spores is moderate to light?
A. I would -- and I'm -- again, I'm going to give you a ballpark, but I would say somewhere between 10 and maybe 75, or something like that.
Q. All right.
A. Per -- for that whole trace.
Q. And that's particles per field, right?
A. No. That would be if you're looking at that more of particles per -- per cubic meter.
Q. Okay.
A. And in these samples there are 30-liter samples. So...
Q. Do you have any opinion on whether air samples or surface samples are more reliable?
A. I'll say in some cases it depends. It's easier to get recovery from a surface sample than it is from an air sample because the air samples tend to be variable and are affected a lot more by let's say a disturbance in the environment, and there's a lot more variables. So

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I've taken samples in, let's say, a half hour apart, and it's been very different. So there's a lot of variability associated with the air samples. With a surface sample, it tends to be less variable.
Q. Okay. Is that because a surface sample has to be disturbed more to -- to move?
A. I would say, yes, or it's settled there and it hasn't -- you know, I'm not -- I'm not relying on the aerodynamics of the particles to move around or mechanical force to move it.
Q. Okay. So there's a column on here in Exhibit 2 titled Trace Density. Do you see that?
A. Yes.
Q. Where do the terms moderate or light to moderate or heavy come from? Are those from some independent source, or are those your characterizations?
A. They're my characterizations. I've seen them on other reports. And essentially it helps. At least my intention is to help the person that I'm sending the sample, saying that -- that there's a -- and it's kind of a -- it's on a relative scale, but are -- are the particles very dense or are they not too numerous. So, in other words, it would be I can give you a ballpark, and it may be less than 10 particles per field on a rough basis would be considered light. I mean I'm

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looking through and I can see fairly clearly. For a heavy one I would see almost a matte of particles, and that would make it more difficult for me to see, to determine the particles that are -- are -- are present and do an identification on.
Q. Okay. Let's move. Just past that table there's a Char and soot-like particle interpretation section there. Do you see that?
A. Yes.
Q. Where does that table come from?
A. That one was -- and I can't -- I don't recall the exact place it was from. I think Tom Irmiter may be able to help you answer that question.
Q. Okay. So, as you sit here today, you don't know where this table came from?
A. I don't remember. I don't recall exactly where it came from, but I recall somehow looking through some other reports and finding that this seemed to be more or less a way that people were looking at it. It is similar to what -- as far as interpretation, I don't think it's there, but the EMLab P&K seminar on it did have subrogations based on that that were fairly similar to this. So I would say that would probably be close to.
Q. That kind of brings me to my next question. Is there a generally accepted particle count that constitutes, you

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know, negligible, limited, moderate, or significant, or major?
A. I think there's general agreement on the major part of it. In other words, if they're -- the way that this is typically interpreted and is primarily tease tape samples slightly modified for the Air-O-Cell sample. But for a tease tape sample, if about 50 percent of the particles you observe in a field are of one type, that would be considered a major impact. And if you can't -- then on the other end it's negligible if you can only find less than 1 particle. That would be considered negligible. In between there I think there's probably some room for interpretation.
Q. Okay. Is there any publication you can point me to that establishes any sort of standard for how these particle counts are characterized?
A. There may be some, but I can't off the top of my head.
Q. Okay.
A. No.
Q. So like if you look at the trace density of sample 1 in Room 407, it's described as moderate, correct?
A. Yes. Yep.
Q. And the primary particles, you observed char less than 1; soot less than 1, correct?
A. Yes.

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Q. And if we go to char and soot-like particle interpretation, moderate is 2 to 10 particles per field, correct?
A. No. The -- you're looking at the trace density? Or where are you?
Q. Yes.
A. Okay. You're looking at -- sorry.
Q. That's okay.
A. The moderate, the trace density has nothing to do with that interpretation.
Q. Okay. And why not?
A. It just has to do with the total number of particles that are in there, but not the -- the number, if you're going to interpret it, that would be the number after the char. So look at the number after the char. It's less than 1. And then, if you look at the -- that would be particles per field. Does that make sense to you? So it would be under the limited impact of smoke.
Q. Okay. All right. So 1 would be --
A. Less than 1 would be.
Q. -- limited?
A. Yeah.
Q. Correct?
A. Yep.
Q. All right. 4 would be limited to moderate, correct?

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A. Yeah. 4 would be like moderate, yeah.
Q. For char at least?
A. Yeah.
Q. Correct?
A. Yeah.
Q. Sample 6 would be limited, correct?
A. Yep.
Q. Okay. Sample 9 would be limited as well, correct?
A. That's correct, yes.
Q. As to char?
A. Yep.
Q. And back to sample 1. Soot would be negligible, correct? Or limited?
A. Limited, yep. Yep.
Q. 4 would be negligible, correct, for soot?
A. Yeah. That be would be negligible. Yep.
Q. All right. 6 would be limited for soot -- or negligible to limited for soot, right?
A. Negligible for soot, yeah.
Q. Okay. So 9 would be negligible for soot, correct?
A. That's correct. Yes.
Q. Sample 9 would be limited impact for char, correct?
A. Yes.
Q. And then sample 10 would be negligible impact for both char and soot, correct?

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A. Yes.
Q. Sample 12 for char would be significant impact, correct, for char?
A. Yes.
Q. Okay. And it would be negligible for soot, correct?
A. Yes.
Q. Sample 13 would be moderate impact for char and negligible for soot, correct?
A. Yes.
Q. Okay. Samples 14 and 16 would be negligible for both char and soot, correct?
A. Yes.
Q. Sample 17 would be limited for char, correct?
A. Yes.
Q. Negligible for soot, right?
A. Yes.
Q. Sample 19 would be limited for char, correct?
A. Yes.
Q. And negligible for soot?
A. Yes.
Q. And sample 20 would be limited for char and negligible for soot, correct?
A. Yes.
Q. Okay.
A. And did you want to do 19, or not?

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Q. Did I skip 19?
A. Yes.
Q. Ah. 19 would be limited to moderate for char and negligible for soot, correct?
A. Yes.
Q. All right. Did you have any role in determining where these samples were taken from?
A. No, I did not.
Q. Is there a typical number of samples that you receive when you're doing work with FBS?
A. No. It's highly variable. It depends on how many samples that they -- in their professional opinion determine they need to set up the scope. And I assume there's also a budget involved as far as how many samples that they're allowed to take.
Q. Are you aware of any established standard or protocol governing the number of samples that must be taken per square foot or cubic foot of a building?
A. I am not personally aware of that.
Q. Okay. So, if we move down here to the tape samples on Exhibit 2, you see there's one Room 407 wood burning fireplace tape lift. Do you see that?
A. Yes.
Q. And it looks like you've identified quite a bit of char in that sample, correct?

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A. Yes.
Q. And that's 50 plus particles of char, right?
A. Yes.
Q. But no soot, correct?
A. Yes.
Q. Okay. Is there a typical proportion of char to soot that you see in wildfire residue?
A. I would not be qualified to answer that question.
Q. Okay. Would you be qualified to -- well, let me ask a similar question. Is there a typical proportion of char to soot that you would expect to see just from use of a wood burning fireplace?
A. I'm not -- I don't know.
Q. Okay. Do you consider yourself qualified to even answer the question?
A. With respect to knowledge about the proportion of char and soot emanating from a fireplace, I'm not qualified to answer that question.
Q. Okay. Do you expect to see more char or soot in a wildfire?
MR. SCOTT: Object to the form.
Q. (MR. DEVILLING) That was a poor question.
Do you know if -- if you would expect to see a higher level of char or a higher level of soot in a wildfire?

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A. I'm not qualified to answer that.
MR. SCOTT: Object to the form.
A. Sorry.
Q. (MR. DEVILLING) Let's look at Exhibit 3.
A. Okay. That is the Rocky Waters Motors Inn?
Q. Correct.
A. Okay.
Q. And Exhibit 3 is a true and correct copy of your report with respect to your analysis for the Rocky Waters Motor Inn, correct?
A. Yes.
Q. Okay. And it's got the same char and soot-like particle interpretation table, correct?
A. Yes.
Q. Okay. So is trace density, in that column, is that basically like your impression just looking at the density through the microscope?
A. Yes. It's looking at the total number of particles, irrespective to type.
Q. Ah, okay.
A. Does that help?
Q. Yes. Yes. Okay. So, for example, sample number 4, Room 105, bathroom, dropped ceiling, it says trace density very heavy. That just means it's a very heavy concentration of lots of different types of particles?

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A. Yes.
Q. All right. And do you know what types of particles those might be?
A. I don't recall. I'll see -- if it's okay for you, I'll see if I have the photo from that.
Q. Sure.
A. It might help. I do not have the photo from that; so I would not know.
Q. In analyzing samples like this under a microscope, are you typically seeing more particles than just the char and the soot?
A. Yes.
Q. For example, there could be -- there could be like residual dead skin, correct?
A. Yes.
Q. Could be dead insects in there, correct?
A. Yes.
Q. All right. Could be burnt clays, right?
A. There could be; although, I -- I don't do analysis for that. So...
Q. Okay. Suffice to say, there's lots of other types of residue in -- in a tape sample that you're looking at, correct?
A. Yes.
Q. And what you're doing is just trying to identify the

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char and the soot within all those other types for your analysis?
A. The char-like and soot-like particles.
Q. Okay.
A. Yes.
Q. Okay. If we look at this report here, Exhibit Number 3, let's go to the -- let's take sample number 2 and sample number 4 as an example. So, when you're looking at sample number 2 and describing the trace density as light, can you give me an estimate of the number of particles per field that you're talking about there?
A. It would be a range probably less than 5 particles per field. It's very easy to see through. There isn't a lot of obstruction.
Q. Okay. And then we've got number 4. Trace density is described as very heavy. Can you tell me about how many particles per field very heavy would be?
A. There would be thousands of particles per field.
Q. Okay.
A. It would be essentially like looking like this.
Q. Okay. So, when we see under number 4, 8 to 10 char particles per field, that says nothing about what the percentage of char is with respect to all of the other substances that are on that tape, correct?
A. Yes. That would be correct.

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Q. Okay.
A. The char particles would typically be the darker particles, and there would be lighter colored particles that I wouldn't know. And in that case the soot particles would be extremely hard to see because they're smaller, and they would be covered up by everything else.
Q. Understood. Okay. If you go to the tape samples, it looks like sample 1 and sample 12 are both fireplace samples, correct?
A. Yes.
Q. And number 1 you found char particles 20 to 30, and soot 50 plus, correct?
A. Yes.
Q. And then sample 12, you have char participate 10 to 20 and soot 50 plus, correct?
A. Yes.
Q. If you compare that to the fireplace sample that was taken from the Days Inn, that would be sample number 2. Do you have that?
A. Yes. I have both of them. That would be sample number 2 from the -- let me make sure I've got the exhibit right.
Q. Exhibit 2.
A. Yes. That's correct, yeah.

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Q. So, comparing sample 2 from the Days Inn from sample 1 from Rocky Waters Motor Inn, there are a few differences there, correct?
A. Yes.
Q. All right. For one thing, there's soot at Rocky Waters Motor Inn, but no soot over at the Days Inn, correct?
A. Yes.
Q. Can you explain --
MR. SCOTT: Object to the form.
MR. DEVILLING: Yeah. Let me restate that question.
Q. (MR. DEVILLING) so, for one thing, there's soot shown in sample number 1 from the Rocky Waters Motor Inn, but no soot shown in sample number 2 from the Days Inn, correct?
A. Yes.
Q. All right. Can you explain why there is 50 plus level of soot in sample number 1, but no soot in sample number 2?
A. It would require me to speculate.
Q. Okay. And can you tell me why there's a difference in the proportion of char to soot in -- as between sample number 1 and sample number 2?
A. Again, it would require me to speculate.
Q. Okay. What are there -- what potential reasons could

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there be for presence of 50 plus soot particles in one wood burning fireplace and no soot particles in another wood burning fireplace?
A. Well, there may be --
MR. SCOTT: Object to the form. I think he's already testified that he's not qualified, but you can answer.
THE WITNESS: Yeah.
Q. (MR. DEVILLING) If you know.
A. It would be generally a different combustion temperature, or it may be a different sampling location.
Q. Okay.
A. So there may be some char over here. May be some soot over here, and you're sampling with a tease tape, trying to represent an area. So...
Q. Okay. And, again, I'm just asking you what some possibilities might be.
A. Yeah.
Q. And not...
A. Yeah.
Q. I understand that's not -- not something that you know for certain, correct?
A. That is correct. Yes.
Q. Okay. If you go back to the char and soot-like particle interpretation on here, you see it's listed at 400x,

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correct?
A. The -- that's -- yeah. That's the magnification.
Q. Okay. Now, if we go to your comments after the tables, right now I'm looking at the Rocky Waters Motor Inn Report. That's Exhibit 3.
A. Yes. And are -- a question. You're referring to the discussion section?
Q. Well, I want to talk about methods first.
A. Okay. Yes.
Q. It says the Air-O cassette traces were identified under light microscopy viewed at 100x, 200x and 400x, correct?
A. Yes.
Q. I thought you said your microscope only went to 60x.
A. No. 600. It's -- the 60x is the magnification. There's a 10. Good question. There's a 10x, 10x up here and 60 down here.
Q. Ah.
A. And that goes --
Q. Okay.
A. So thank you for clarifying that.
Q. Thank you for clarifying.
A. Yes.
Q. That's what I was --
A. I couldn't see very much if it was only 60.
Q. Yeah. Okay. So you've got -- you've got one lens up

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top that's 10 and the other, that's 60. At the bottom, you put it together, you get 600, correct?
A. That's correct. Yes.
Q. Okay. Thank you. And then to change the magnification, you just change out the lens at the top, correct?
A. You change out the lens at the bottom.
Q. Ah, okay.
A. 10 always stays up at the top, and then you change the ones at the bottom.
Q. Okay. My mind's still stuck in the microscope I used in fifth grade I think.
It says Lacto fuchsin stain in 85 percent lactic acid was used to aid in identification. Can you explain what that means?
A. Sure. Lacto fuchsin is a stain I use primarily for fungal organisms. Although, it does help separate out some of the soot and char particles and make them a little more easier to observe under the microscope.
Q. Okay.
A. It gives it a slight reddish tint to the background.
Q. Okay. And back to this, you said you viewed it at three different magnifications; 100x, 200x and 400x. When you're doing the particle counts above in the table, are those particle counts based on the view at 100, 200 or 400?

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A. The particle counts are based at 400.
Q. Okay. And when you're -- when you're at a 100x and you're looking down at the -- the field through the microscope, do you make a decision as to what part of that field you want to zoom in on next?
A. Yes. I typically will do a full scan. For instance, at 100x or 200x to kind of find out what -- what particles appear to be interesting and then will zoom down on some that I'm -- I'm trying to figure out if they're soot or char, and then I can zoom back and then start doing the counting, but I just want to see if there's -- for instance, on the ones that are really light, I'll just go through and say I don't see much here at all. I've got to zoom in and see if I can find one or two or something like that.
Q. Mm-hmm. Do you typically zoom in to areas that are more dense?
A. Yeah. At least on the initial scan, just to find out what type, what's going on there, what does it look like. Is it -- for instance, from afar, from a distance, in other words, so, if I'm looking at 100x, it's difficult for me to discern whether the dark cluster would be maybe a cluster of fungal particles or char particles, and as I zoom in, then I'll be able to sort that out.

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Q. Okay. But when you make a decision as to which area of the field in the microscope to zoom in on, are you typically then choosing to zoom in on a denser area?
A. I'll look at all of the areas. So that -- so that's what you'll see in some cases where you'll see a range, because the number of particles, particularly more so on the tease tape samples aren't evenly distributed. So there will be some areas where it's really dense and some others that aren't. And that's what kind of puts a variability in -- in that number. You'll see like 20 to 30 because some areas are more dense than others.
Q. Okay. You testified -- I think you testified earlier that you -- you will look at the entire tape area under the microscope during your analysis, correct?
A. As much as I can, and in some cases, if it's fairly obvious that we've got a problem, I'm not going to look at everything. And in some cases, as I do a scan, it seems to be fairly uniform, then I will focus on a small area. And that's particularly with a tape sample where it's a huge area to look at. So I'll focus in on a couple of them that seem to be more representative than -- than the whole piece. With respect to the Air-O-Cell, I will look at the whole trace.
Q. Can you tell me what -- what percentage of the area of the tape sample you end up viewing at 400 times

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magnification?
A. It really varies. Sometimes it would be 5 to 10 percent. Other times maybe 40 or 50. It depends. And then also sometimes the tape that they give me will either be really wide or narrow. And if it's a really wide tape, then the percentage would be down because it will be covering some areas. In other areas I won't look at terribly closely if there's a lot of debris that makes it impossible to see through. So I'm looking for something that looks -- for instance, I'll see some dark shadows in there, but I can't tell what they are. Then I'll move over to a spot that's a little clearer, and I can clarify whether -- what I'm seeing.
Q. Do you know what kind of tape FBS uses to collect their samples?
A. I -- it appears to be Scotch 3M 600. It's the red tartan tape. It's the clear tape.
Q. Okay.
A. That's the one I've told them to use. Yeah.
Q. All right. Do you know if there are tapes manufactured specifically for the purpose of collecting surface samples?
A. I've seen some that have been used. So, yes, I would say there are some that people have used, and they will use either that that's already built in on a slide, and

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then they will switch over to the Scotch 600 if it's an area where it's difficult. For instance, like a curved surface or a difficult surface, then they'll switch over to the tape.

Q. If you go out and collect samples, what kind of tape do you use?

A. I use the Scotch 600 --

Q. Okay.

A. -- because of the optical properties.

Q. It's clearer?

A. It's clear. It's not like the Magic tape, the green tape where you have all this debris in front. You can't see through it.

Q. Under methods, it then says no chemical identification was conducted on the soot-like, char-like particles and carbon black-like particles do you see that?

A. Yes.

Q. And is that a reference to the fact you're doing a Level 1 analysis as opposed to a Level 4?

A. Yes.

Q. Okay. It says soot-like. What do you mean by soot-like particles?

A. It means that the analysis that I'm doing is there are other particles that could be similar to soot and would look visually similar upon identification. So I'm doing

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a presumptive analysis of soot. So I'm saying this appears to be soot to me. It has optical properties for it, but, if you want to do more thorough analysis, you can go to a Level 4 to make sure that that -- that that presumption that I'm making in this case is correct.

Q. Okay. What other kinds of particles look like soot?

A. There are a couple different ones, and they'll typically manifest slightly different. But paint particles, for instance, spray paint particles, if they're aerosolized and they break up, they'll typically be -- they'll typically be in spheres, but sometimes the spheres break up, and they can look somewhat similar to a soot-like particle. If a -- if some of the carbon-like particles will break up, you'll also see something that looks fairly similar to -- to soot. And there may be some other ones that I can't recall off -- off the top of my head. There's some mineral deposits or minerals that will look somewhat similar; although, they're -- the light refraction on it is slightly different. But, again, if it's a really heavy, dense piece, then I'm having a difficult time trying to do that, and I would say, you know, I'd make some notes on that one.

Q. Okay. And you list three types of particles here; soot-like, char-like and carbon black-like. What is a carbon black-like particle?

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A. Those are typically -- they can break into smaller particles like soot, but they're typically very spheroidal. So there will be a cluster into a sphere, as opposed to that rough configuration that you would have with a soot that looks like very tiny grapes. This would be a very black sphere, and it typically will range in between, oh, let's say 3 microns in size to 20 to 30 microns in size.

Q. And that's -- that's how it appears under the microscope, right?

A. That's how it appears under the microscope, yes.

Q. And what I'm actually wondering is just what are carbon black particles, just what kinds of materials?

A. You could produce them like from a copy machine, very similar to it. You'll have a -- so they're -- it's essentially strictly made out of carbon, and they tend to agglomerate based on the temp -- and I'm not an expert with respect to the temperature required for the production of it. But they will agglomerate much differently than the soot particles.

Q. Do they come from specific types of materials?

A. I'm not -- I'm not sure of all of the materials where that comes from.

Q. Okay.

A. No.

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Q. By the way, did you -- were you looking at all for ash?

A. I was not.

Q. Okay. And you understand that ash is a different substance than char and soot?

A. Yes.

Q. By the way, how would you define char?

A. Char would be a -- typically a product of combustion that results in plainer, typically opaque to moderately opaque material that has some of the original constituent of the material that's burned, and it will have a very flat sheetlike appearance. So the aspect ratio is very thin, and it will have much more length and width, and it will have sharp edges under light microscopy.

Q. How do you define soot?

A. Soot would be submicron sized spheroidal particles that are aggregated in microscopic grapelike structures that have rough edges, and they're produced as a part of a combustion process, typically different than the process of char-like particles.

Q. And then how would you define ash?

A. Ash would be the mineral, minerals that are typically released during the production of fire.

Q. Is it fair to say that in terms of on the spectrum of the completeness of combustion of the material that char

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is the least combusted and ash would be the final product of combustion?
A. I -- I don't know.
Q. Oh, okay. All right. And then it says under methods, presumptive identification was based on particle morphology, correct?
A. Yeah.
Q. And I think we've already pretty much touched on that. And then you've got photographs attached to Exhibit 3 here. It looks like just three photographs, correct?
A. That's correct. Yeah.
Q. And are these photographs that were actually taken from the samples you analyzed?
A. Yeah. Yes. That's correct.
Q. Did you take any more photographs than these three?
A. I probably did, and I -- I chose the ones that seemed to be the most relevant to...
Q. Okay. Do you know if you still have all of the photographs that you took?
A. I do not know that.
Q. I'm sorry. You do not know?
A. I do not know if I do.
Q. Okay.
A. I sometimes look for them and not found them. So --
Q. Okay.

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A. -- in the past.
Q. On Exhibit 2, it looks like you included eight photographs, correct?
A. Let's see. Well, I've got one, two, three, four, five, six, seven, eight. Yep.
Q. So it looks like a total, between the two reports, you've got 11 photographs total, correct?
A. Yes.
Q. How many different samples do you have photographs of in this report?
A. One. Let's see. One, two.
MR. SCOTT: Which report?
MR. DEVILLING: Let me -- let me strike that.
Q. (MR. DEVILLING) How many samples do you have photographs of in both reports?
A. Okay. One --
Q. That's still a poor question. Let me strike that.
A. Okay.
Q. There are 20 samples total between the two reports, correct?
A. Let's count that up.
Q. No. That's not even correct.
A. That's not correct.
Q. All right. Let's take them one report at a time.

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A. Well, that sounds good.
Q. Usually when Clint speaks, I learn.
A. Eighteen samples in --
Q. All right. So Exhibit 2, Days Inn, we've got a total of 20 samples, correct?
A. Yes.
Q. All right. And of those 20 samples, how many samples do you have pictures of?
A. Six.
Q. And then in the other report, Exhibit 3, how many different samples did you analyze?
A. Did I -- I analyzed -- let me check for a final number there. Eighteen.
Q. And how many photographs do you have? It looks like three different samples of photographs, correct?
A. Yes.
MR. DEVILLING: We've been going a while. Why don't we take about a five-minute break?
THE WITNESS: Okay.
THE VIDEOGRAPHER: Very good.
MR. SCOTT: All right.
THE VIDEOGRAPHER: We are going off the record and the time is 2:25 p.m.
(Break taken at 2:25 p.m. - 2:33 p.m.)
THE VIDEOGRAPHER: We are back on the

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record, and the time is 2:33 p.m.
Q. (MR. DEVILLING) Okay. In looking at any of the samples that you reviewed in this case for either hotel, did you find any traces of chemical fire retardant in the samples?
A. I was not analyzing for that, no.
Q. Okay. Did you see anything that you thought was trace amount of fire retardant?
A. I would not know it if I saw it.
Q. Okay. Are you aware -- and if this is outside of your expertise, that's fine. Just let me know. But are you aware of any regulations governing cleanup of wildfire debris?
A. I don't know specifically on regulations.
Q. All right. In terms of recommendations for remediating any debris there, is that something you would defer to Mr. Irmiter on?
A. I would do that, yes.
Q. Okay. I noticed there's no specific recommendations contained in either of your reports, correct?
A. That is correct.
Q. Okay. Your report has dates on which the cassette samples and tape samples were taken. I've got January 4th. Well, it looks like January 3rd and 4th, 2018, on the Days Inn. And I've got January 4th and 5th

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on the Rocky Waters Motor Inn on your reports.
Do you have any opinion as to whether there are advantages to taking samples closer in time to the event?
A. I need to think about that. It's -- it's helpful on the Air-O-Cell cassette if you are taking them immediately after rather than at a longer time since because you have a chance to see that suspension that's in the air immediately after the smoke event. And then the people that are actually taking the sample that have experience with fire remediation can take that into account, the time differential.
Q. Do you agree that air samples are just a snapshot in time of the air at a given location?
A. Yes.
Q. What is gas-phase soot, if you know?
A. I'm not familiar with that term.
Q. Okay. Do you know whether the -- and this might be an obvious question. Maybe not. But the particles that you're looking at under a microscope, those are solid-phase particles, correct? In other words --
A. I would think they would be because -- again, I -- that term, that differentiation between solid and gas phase is something I haven't looked at specifically.
Q. Okay. Are you familiar with the different forms of

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soot, such as aciniform carbon, carbonaceous xerogel particles, carbon cenospheres, and coke and char fragments?
MR. SCOTT: Object to the form.
THE WITNESS: Just clarification, do I still answer, or is that just a...
MR. SCOTT: Yes.
THE WITNESS: Okay. All right. Just want to make sure that -- okay.
A. The aciniform I'm somewhat familiar with, and that's what I've described for you. That's the grapelike structures. The other three I'm not as familiar with.
Q. Okay. So we're dealing with aciniform carbons here in this case; is that correct?
A. Yeah. The ones that I'm seeing are more -- that -- that I'm able to see and that I've -- now there may be the other ones may have been present, but I've been focused on the aciniform.
Q. Okay.
A. And to clarify, that's with respect to soot.
Q. Okay.
A. Yeah.
Q. What kind of mounting medium is used under the microscope? A slide?
A. Yeah. Microscope slide was placed on the -- on the --

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it's different between the tease tape and the Air-O-Cell. Would you like me to clarify that, or...
Q. Sure.
A. Sure. With the tease tape sample, the slide is placed down. The mounting fluid is placed on the slide, and then the tape is placed over that. And then I described previously how the Air-O-Cell is put together.
Q. Okay. Did you use any polarized light in your microscopy?
A. There was no polarized light. It was optical light microscopy.
Q. Did you use any reflected light?
A. I'm not sure exactly what you're referring to on that.
Q. Is there a microscopy technique known as -- that's a reflective light technique?
A. I'm not using a specific reflective light technique.
Q. Okay. Is there a microscopy technique known as dark field illumination?
A. There is one, but I didn't use it.
MR. DEVILLING: Okay. Okay. Those are all the questions I have. Thank you for your time.
THE WITNESS: You're welcome, sir. How long are you here?
MR. SCOTT: No questions. Neil will read and sign.

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THE WITNESS: All right.
THE VIDEOGRAPHER: And we are going off the record, and the time is now 2:40 p.m.
(Whereupon, the deposition concludes at 2:40 p.m.)

ERRATA SHEET

Page/Ln	Correction	Reason

I, Neil G. Carlson, have read this transcript, pages 1 - 69, and acknowledge herein its accuracy except as noted on the errata sheet.

_____
Signature

_____
Notary Public

STATE OF MINNESOTA

CERTIFICATE

COUNTY OF CARVER

I, Christine M. Clark, RPR, hereby certify that I reported the Videotape Deposition of Neil G. Carlson on this 28th day of February, 2020, in Minneapolis, Minnesota, and that the witness was by me first duly sworn to tell the truth and nothing but the truth concerning the matter in controversy aforesaid;

That I was then and there a notary public in and for the County of Carver, State of Minnesota; that by virtue thereof I was duly authorized to administer an oath;

That the foregoing transcript is a true and correct transcript of my stenographic notes in said matter, transcribed under my direction and control;

That the cost of the original has been charged to the party who noticed the deposition and that all parties who ordered copies have been charged at the same rate for such copies;

That the reading and signing of the deposition was not waived;

That I am not related to any of the parties hereto, nor interested in the outcome of the action and have no contract with any parties, attorneys or persons with an interest in the action that has a substantial tendency to affect my impartiality;

WITNESS MY HAND AND SEAL this 3rd day of March 2020.

Christine M. Clark, RPR
Notary Public